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DETROIT

SCIENCE NEWS LETTER

Vol. 51, No. 9

THE WEEKLY SUMMARY OF CURRENT SCIENCE - MARCH 1, 1947



Fractions of Blood

See Page 130

A SCIENCE SERVICE PUBLICATION

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GEOGRAPHY

Antarctic Hot Spot

Antarctica's recently-discovered warm area with never-freezing lakes of strange colors is duplicated here in the U. S. Other hot springs areas are in the Far North.

► ANTARCTICA'S new-found "Shangri-La", with the strangely-colored, never-freezing lakes reported by Adm. Byrd's explorers, is by no means the world's first-known spot kept free of snow and ice through polar weather by the warmth of thermal waters.

Yellowstone National Park, right here at home, has several such areas. Temperatures on the Park plateau drop to the truly Arctic levels of 60 and more below zero, yet the various geyser and hot-springs areas not only remain snow-free, but green grass and small shrubs grow along the banks of the warm streams that flow from them. There is enough of such natural hot-house vegetation to maintain a few elk in the upper geyser basin when all the rest of the herd has migrated to the lower-level winter pastures. Hot springs on the shore of Lake Yellowstone maintain an ice-free zone for yards off shore, where overwintering little flocks of pelicans and seagulls manage to pick up a living. And the strange colors reported from the Antarctic can be duplicated in Yellowstone's warm pools and weird mud geysers.

The same story can be repeated, with variations, of hot-springs areas in the Far North. There are hot springs and natural steam vents on the Alaskan mainland, among the volcanoes that rise on the Aleutian chain like knuckles on a long finger, and along the shores and in the valleys of Kamchatka, the peninsula that faces Alaska from the northeast corner of Asia. All of these keep at least little areas snow-free the year round. It is even reported that the people of

one small Russian settlement near the coast of Kamchatka have put a captive hot spring to work keeping a greenhouse warm, so that they may have otherwise unobtainable green vegetables.

Classic of all hotwater areas in northern lands, of course, is Iceland. That island's one major periodic hot spring, the Great Geysir was known for centuries before Yellowstone was discovered, and has given its name to all geysers everywhere. The little river on which Iceland's capital stands never freezes, and is believed to be responsible for the city's name of Reykjavik, which means "smoking creek".

None of these northern thermal areas is nearly as close to the North Pole as the new-found warm spot in Antarctica is to the South Pole. They are all below the Arctic Circle.

The one thing that all such areas have in common is association with volcanoes, either active or extinct. The steam and hot water that flow up through vents in the surface are believed to be partly from water trickling down and contacting deeply buried hot lavas or magmas, partly from steam given off by the melted rock itself.

There are more than enough evidences of volcanic activity in Antarctica to account for a thermal area like the one reported. Geologists with former expeditions have reported an abundance of volcanic rocks, and at least one of Antarctica's mountains, Erebus, has been seen several times in at least mildly active eruption.

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ticular chemical binds either copper or iron firmly to itself to transport these elements through the body.

It turned a dark, brownish red when Dr. Cohn added iron instead of copper.

"It is my job to make these chemicals from the blood available," Dr. Cohn explained. "It is the task of physiologists and physicians to discover what role they play in the body and how they can be used to treat sick patients."

Already some of the blood fractions isolated and made available by Dr. Cohn and his coworkers are fighting disease:

Little children are being protected against measles by injections of one of the blood chemicals.

Sufferers from hemophilia, the hereditary bleeders' disease called the "curse of the Hapsburgs", may be helped by another.

Better treatments of anemias and other blood diseases are being explored with other blood chemicals.

The new iron-copper carrying blood chemical is known as beta one globulin, or fraction IV-7. It is one of the chemicals obtained as a sort of by-product to the war-time production of serum albumin for transfusion to the wounded. First obtained in a mixture of other blood chemicals, it has now been obtained in crystalline form as a single chemical. Dr. Bernard Koechlin, working in Dr. Cohn's laboratory, was responsible for this advance.

The other new blood chemical separates from human serum albumin as a mercury salt. This was obtained by Dr. W. P. Hughes, Jr., another of Dr. Cohn's associates at Harvard.

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CHEMISTRY

Chemical "Frost" Matures Cotton, Hastens Opening

► FAILURE of cotton bolls to open up all at the same time has been one of the main problems of cotton picking, whether by hand or machine. Noting that a light frost, sufficient to cause the leaves to fall off, also causes unopened bolls to hasten their maturity and come open, Dr. John F. Kagy and D. T. Prendergast of Long Beach, Calif., sought a chemical that would have the same effect. This they found in an organic compound known as pentachlorophenol, applied as a dilute spray. Patent 2,416,259, covering this process, has been assigned to the Dow Chemical Company.

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MEDICINE

Blood May Provide Cures

See Front Cover

► TWO NEW CHEMICALS from the blood, that doctors may use some day to cure ills, were announced by Dr. Edwin J. Cohn of Harvard, famous for his blood plasma researches.

Green, not red, was one of these blood fractions when Dr. Cohn added a copper solution to the colorless fluid as he demonstrated before Washington chemists.

Alone among the 25 known chemicals of the human blood plasma, this par-

PSYCHIATRY

Man Given Nursing Bottle

Grown people have sucked on baby bottles to recall infant experiences with the result of cured insanity that was caused before the talking age.

► A GROWN MAN sucks for hours on a nursing bottle to recall suppressed experiences when he was a baby.

This is the latest cure for insanity.

It really works. The manic patient, "raving mad" as an ordinary person would say, regained normal behavior.

Dr. Carl A. Whitaker, Emory University psychiatrist, told the American Orthopsychiatric Association at Cincinnati of the amazing case.

The patient was a 26-year-old industrial worker whose mental sickness was the manic type. He was overexcited and overtalkative with the noisy behavior of manic patients. Every kind of psychiatric treatment, including shock therapy, had been given this patient without effect.

Then the doctors gave him a baby's nursing bottle to suck. He took it and promptly had a "most amazing explosion" of emotional and physical excitement which left him exhausted. He was given the bottle every day for a week. On the eighth day he said, "Well, I'm not a baby any more. I don't need the bottle."

Within one week he was well. Two other grown persons and several children have been helped to get over mental sickness by the use of nursing bottles, though their cases were not so dramatic.

The use of this nursing bottle method depends on the psychiatric principle that frightening experiences very early in childhood are often the cause of mental illness or breakdown later. Psychoanalysis, hypnotism and other methods are used to help the patient recall these experiences which have been buried deep in his subconscious mind. Once he has recalled them he is helped to see how they affected his life and how he can be free of the buried fear that was driving him crazy.

If the fright happened before the child was old enough to know words and talk, he would not be able later to recall the experience, Dr. Whitaker reasoned. He could not tell about the fright if he felt it before he knew the word for it. This might explain failure of patients to recover under psychiatric treatment.

So Dr. Whitaker decided to put the

patient into a situation where he could relive the experience without words. Sucking to get food is one of the earliest activities in life and one associated with feelings. Use of the nursing bottle followed this line of reasoning. With its aid patients relive the feelings of fright and stress and strain of babyhood and are able to release the emotional tension these caused. With the release of the tension, they are able to shed their unconsciously babyish attitudes and to feel and behave like normal, grown persons.

Dr. Whitaker says he is coming more and more to the point of using the nursing bottle method all the time for all mentally sick patients.

He is even considering a new type of chair for patients during psychiatric interviews. The chair would be one in which the patient can curl up under a cover and in darkness to get as near as possible to the situation and feeling

of a baby in its mother's womb. The position unconsciously taken by one of his grown-up patients when she was first given the nursing bottle treatment suggested this.

A little colored boy who developed epilepsy gave Dr. Whitaker one clue to the nursing-bottle method of treating insanity. The child at the age of seven stopped talking completely. At 10 years, he had gone so far back toward babyhood that he was picking up and putting into his mouth everything he could lay hands on, just as babies do when they are first learning what objects are. Observing this child suggested the use of the nursing bottle for child victims of mental illness.

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PHYSICS

Radar-Like System Uses Supersonic Vibrations

► A RADAR-LIKE system, but using supersonic vibrations instead of radio waves, detects ships, airplanes, tanks, etc. This now-it-can-be-told wartime device is the invention of Dr. L. W. Chubb of Pittsburgh, who has assigned rights in his patent, No. 2,416,155, to the Westinghouse Electric Corporation.

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HOOK HAND—The new artificial hand, developed by the U. S. Army Medical Department, is shown in this U. S. Army Signal Corps photograph. It is the best that can be provided from a utility standpoint since it operates more effectively for the amputee and in addition looks like a natural hand.

MEDICINE

Psychiatry for Epileptics

With treatment for emotional problems epileptic children have fewer fits and need less medicine. Release of emotional tension aids improvement.

► EPILEPTIC children have fewer fits and need less medicine when they get psychiatric treatment for their emotional problems. And they can be helped so that they will not be behavior problems or peculiar.

A treatment program achieving these results at the Baird Foundation Clinic, New York, was reported by Dr. Leopold Deutsch and Louise L. Wiener at the meeting in Cincinnati of the American Orthopsychiatric Association.

Almost half, 24 of 57 children, improved and continued to show improvement when retested after a year. Fifteen are still under treatment. Eighteen remained unimproved.

Very few of the children were mentally defective or had any organic defect of the brain structure. Most of them had the same neurotic behavior and personality disorders seen in any child guidance clinic. Some were aggressive, but as a whole the group was less destructive than most child guidance clinic patients. Play materials in the treatment room almost never had to be replaced, although with other groups of children suffering behavior disorders it was necessary to

refurnish the treatment room two or three times in a similar length of time.

In some cases the epilepsy made worse the difficulties these children had in growing up, the same kind of difficulties many children without epilepsy have. In other cases, the teasing, humiliation and fear that they suffered because they were subject to fits cause the nervous or mental illness. In some cases the children were babied by parents who themselves were afraid the children were in greater danger of being run over or otherwise getting hurt because they had epilepsy.

Epileptic children seem to be afraid to show aggressiveness the way non-epileptic children do by grabbing, fighting and throwing things. They are afraid of retaliation. At the clinic they found they could be aggressive without being punished. With tension thus released, they had fewer fits, or seizures, and needed less medicine.

The outlook for epileptic children always will be better, the New York scientists believe from their experiences, when the children are given a chance for proper release of emotional tension.

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PALEONTOLOGY

Hunt for Man-Ape to Begin

► A SCIENTIFIC task force, equipped to pick the lock of what may be a most dazzling evolutionary treasure chest, is now making detailed plans to embark this summer from the University of California for South Africa.

Fragments of a man-ape, as provoking as a couple of sample doubloons to a Captain Kidd, lead the Berkeley scientists to believe that in the hard limestone caves near Johannesburg they may find an ancestor to man who could be three million years old.

Two skulls, an ankle bone, a femur and a finger bone, recovered by Dr. Robert Broom, of the Transvaal Museum, from blasting during mining operations at one of the cave deposits, are the most enticing specimens to be investigated.

The Berkeley expedition, one of the best equipped of its kind ever to be or-

ganized, will be prepared to drill into the hard limestone deposits to extricate whole specimens of the man-ape, if they exist.

They will also attempt to find evidences of fire, artifacts, fossilized seeds and leaves of plants, and skeletons of other animals. With such information it may be possible to assign the man-ape a place in the scale of man's evolution, if indeed he is an ancestor to man.

Dr. Charles L. Camp, eminent paleontologist and director of the University's Museum of Paleontology, is supervising all scientific phases of the expedition. He is a veteran of South African scientific exploration. Ten years ago he brought out of the Dark Continent what is probably the best collection of fossil reptiles ever excavated there.

Dr. Camp, who says that he has al-

ready made arrangements to work with Dr. Broom, believes a successful assignment of the man-ape's age and succession may give scientists a new starting point in man's evolution. If the specimens are pre-man types, he says, it may be possible to trace back another step toward the ape or ape-like type from which man originated.

Success in the exploration could take scientists back to the Pliocene epoch of geological time, about three million years ago, before the glacial epoch, Dr. Camp states.

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MEDICINE

Cancer Cure On Way

Many scientists are at work on problems of growth, and any day one of them may unlock the door to this secret of nature. Promising leads have already been made.

► A CURE for cancer will be found.

This is the considered opinion of top-flight cancer authorities given at the meeting of the National Advisory Cancer Council in Washington.

Here are the reasons:

Five promising leads to cure of cancers have already been found through physics and chemistry since 1939. They are: 1. Injection treatment with male sex hormone to relieve pain and prolong lives of elderly women with breast cancer. 2. Discovery that a chemical, urethane, brings at least temporary improvement in leukemia and other types of so-called blood cancers. 3. Discovery that the nitrogen mustard war gases give at least as good results as X-rays in treatment of some of these blood cancers. 4. Radiophosphorus for leukemia and radioiodine and other radioactive chemicals, atom bomb by-products, as potential cancer weapons. 5. Discovery that sugary chemicals from some germs can destroy cells in animals, leaving normal cells unharmed. These chemicals, now being tried on patients, are a development by American scientists that is equivalent to the much-publicized K-R anti-cancer serum of Soviet scientists.

Already one out of five men with

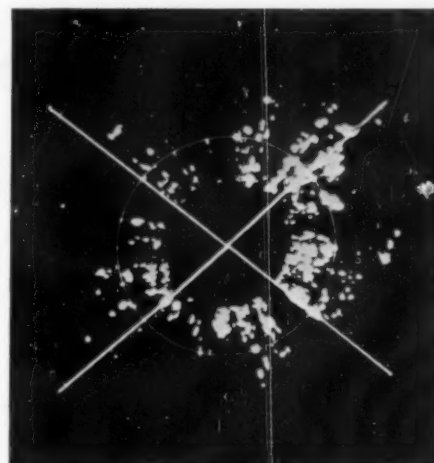
cancer of the prostate gland are being saved from once certain death by treatment for which chemistry gave the lead and which in turn has led to the sex-hormone treatment of breast cancer in women.

Thirty out of every 100 patients with stomach cancer, third most important kind of cancer, can be cured by operation if they get to the surgeon early.

The cancer problem now is about at the point where the atom bomb was just before the uranium atom was split in 1939. Scientists had been talking about atomic power for years before then, but lacked the key to unlock it. Work toward that end, however, was going on in many laboratories. In the same way, scientists in many laboratories are now seeking a key to unlock the secrets of growth. Any day someone may learn one of these secrets which will show the way to conquest of one kind of cancer as splitting the uranium atom showed one way to unlock atomic power.

To help speed that day, the National Advisory Cancer Council recommended grants amounting to about \$300,000 to support 25 studies of cancer in 18 universities, hospitals and research institutions.

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RADAR SCOPE—This is one of the radar scopes, shown in an Army Air Forces photograph, used by the traffic controllers of the AAF All-Weather Airline. The spots of light represent returned radar signals from permanent ground objects such as buildings and hills.

is now being installed at Andrews Field includes micro-wave early warning, MEW, a long-range warning system, and a new traffic-controlled radar, known as CPW-18. Study is now being made of static-free communications for the installations.

Scheduled for early testing on the new airline is the Army's "push-button" C-54 transport plane, designed to fly completely automatically. The plane has made successful flights from its test center at Wright Field, Ohio, but it has not been used on the all-weather run.

Plans for the all-weather air line were first reported last spring in an exclusive Science Service story. Flight operations between Andrews Field and the Ohio base began Aug. 1, after early plans for a transcontinental run were found to be less economical.

Using Douglas C-54 Skymasters, the airline has successfully maintained a schedule of round trips five days a week since then. The airline's primary job is to serve as a testing ground for all-weather flying equipment—and to prove that schedules can be maintained without regard to weather conditions.

Certain Army air safety requirements have been waived to operate the line, but pilots must hold a green instrument certificate gained with more than 1,500 hours' flying time and a minimum of 100 hours of flying under actual instrument time. Pilots flying the run must have completed 50 landings with GCA.

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AERONAUTICS

All-Weather Line Succeeds

► AN ARMY AIR FORCES all-weather air line between Andrews Field, Md., and the Clinton County Air Base, Wilmington, Ohio, has proved that an airline can maintain a schedule in "zero-zero" weather.

In its first six months of operations, the airline has completed 125 round trips. Two flights were not completed but neither was grounded by the weather. One flight was unable to come to Washington because of the number of other aircraft in the Washington "stack," the traffic control system used by the Civil Aeronautics Administration there. The other grounded flight was due to hydraulic failure in the landing gear.

Actually, all flights made by the all-

weather airline are in zero-zero conditions. When the sky is clear, the pilot wears blue goggles to look through a windshield covered with red polaroid glass. He is unable to see through the windshield and flies with instruments to simulate bad weather-flying.

In more than one-fifth of the flights completed by the unique airline, instrument conditions really existed, and the pilot had no need for "blind coloring" of windshield and goggles.

All the landings now are made with GCA, the ground control approach system which uses radar operators on the ground to direct pilots by radio instructions down safely.

New equipment at Wilmington which

ENGINEERING

High Sky Brought in Lab

Two supersonic wind tunnels are being constructed to imitate conditions in the 90-mile mystery belt of the sky. Supersonic speeds will be studied.

► A STRIP of the sky from 100 miles overhead will be brought down into the laboratories of the University of California.

Two new supersonic wind tunnels under construction will create conditions in a 90-mile mystery belt of the sky from altitudes of 50,000 feet to 100 miles for studies of high-speed flight.

Jet-powered, the two tunnels are being built with funds provided by the Office of Naval Research. A pilot model will duplicate conditions up to 70,000 feet, while a larger tunnel, three inches square, will test models in conditions up to 50 miles high and at speeds five times as great as the approximately 760-miles-per-hour speed of sound.

Streams of molecules fired at models by a yet-to-be-designed molecular beam apparatus will create conditions found from 50 to 100 miles overhead.

The new tunnels are based on war-developed vacuum and jet propulsion principles. Instead of the conventional blowers of wind tunnels at or near sea level conditions, the high altitude, supersonic tunnels will be powered by a steam jet vacuum pump, the most suitable device for handling the required large volumes of air at low pressures.

The part of the sky to be studied in the laboratory with the new wind tunnels is the mystery belt of space. Scientists have well-developed physical laws for conditions up to 50,000 feet high, and the influence of temperature and other conditions on atoms and molecules above 100 miles has been determined fairly well.

But the region in between is largely a mystery as far as the principles of fluid flow at supersonic speeds are concerned. This problem of flight at high speeds and high altitude is to be tackled with the new wind tunnels.

Dr. R. G. Folsom and E. D. Kane of the University of California School of Engineering are in charge of the project.

Mr. Kane explained that bringing the sky into the laboratory with the wind tunnels is more effective than firing

rockets or other missiles into the upper atmosphere, because the effect of the air at high altitudes on the instruments is not known.

He said the mysteries of the high-altitude regions cannot be solved by wind tunnels which operate at temperatures and air pressures at or near sea level, because there are fundamental differences in the air. One of these is the change in the number of molecules at sea level and high in the atmosphere. Molecules are much less frequent in the air at high altitudes.

First studies of supersonic speeds in the new tunnels will be made at conditions of altitudes below 50 miles. Equipment for higher altitude studies may be constructed later.

Captured German documents have disclosed that the Nazis had a wind tunnel similar to the ones being built in Berkeley. It was for testing flight conditions at speeds less than that of sound.

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CHEMISTRY

Lab Duster Helps Insecticide Chemists

► A DUSTER which can not be used to help clean the house has been developed for scientists experimenting with insecticides.

Reported to provide control of nearly all variables in dust tests, the new device was developed at the Whitemarsh Research Laboratories of the Pennsylvania Salt Company to study insecticide and fungicide dusts.

A modified laboratory model tower is used in the duster with a new distributor which completely breaks up dust shot into the tower. Exact measurements of the air pressure and amount of air used in shooting the dust into the tower are possible.

From tests in the duster, scientists can determine the type of deposit from a sample, drifting rate of settle, ability of dusts to stick to plants and proper size of particles for insecticidal properties.

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TESTING TOWER—Duster, tower, and dust distributor are shown in this photograph from the Pennsylvania Salt Manufacturing Company.

CHEMISTRY

Treated Soybean Oil Rivals Linseed Oil in Paint Field

► LINSEED OIL now has a new rival in the paint field. It is a chemically treated soybean oil which has similar drying qualities. Linseed oil, for many years, has been the base for paints and linoleum.

The discovery of this process of treating soybean oil to make it suitable for use in paints will free America from reliance on imports of linseed oil, or the flaxseed from which it is obtained, the American Chemical Society meeting in Pittsburgh was told by Dr. Alexander Schwarcman of Buffalo. The United States, now producing annually over 1,000,000,000 pounds of soybean oil, can produce as much as needed to supply the demands of this new use.

Castor oil also can now be used in paints, he said, as a substitute for tung oil, most of which is imported. It must be first treated, however. The treatment process is a dehydration that causes the castor oil to have fine drying properties.

About a billion pounds of linseed oil are consumed annually in the United States, one-half of which is imported, mostly from Argentina. It is used entirely for paint, varnishes, linoleum, and allied products. Castor oil is used in a great variety of industries, mostly for textiles, wall sprays, lacquers and artificial leathers.

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MEDICINE

Hypnotic For Morbid Fear

Pentothal, a hypnotizing drug, brings on a trance that helps patients remember and tell painful experiences that aid psychiatrists in helping them.

➤ A HYPNOTIZING drug that helped soldiers recover from combat-induced mental sickness has helped a civilian patient to recover from his morbid dread of being shut up in a confined space. The case was reported by Dr. Milton Rosenbaum, of the University of Cincinnati College of Medicine at the meeting of the American Orthopsychiatric Association.

The patient was a 50-year-old man who had had a malignant disease that might recur. Ordinary psychiatric treatment might have freed this patient from his morbid fear, but only after prolonged treatment. The patient's age and precarious state of health led his doctor to use the method that had led to swift recoveries of soldier patients.

The drug used is pentothal, one of the modern sleeping medicines. Besides putting a person to sleep it can be given in a dose that will bring on a trance in which the patient is able to recall and relate memories ordinarily shut away because they are so painful.

Just remembering the painful experiences will not cure the mental illness, Dr. Rosenbaum warned. Pentothal is not magic. During the war, psychiatrists found that after pentothal had helped soldier-patients recall their painful combat experiences, the psychiatrist still had to talk to them and help them understand how the experience led to mental breakdown.

In civilian life even more skill will be needed in using pentothal. Dr. Rosenbaum pointed out that the Army psychiatrists had been through much the same experiences as their patients and so could recognize the significant things the patient talked about while under pentothal. In civilian life the psychiatrist must draw on his knowledge of causes of mental illness in general and of the patient's own background and history to recognize what is important in the things he says under pentothal.

In the case of the man with the claustrophobia, or fear of closed spaces, Dr. Rosenbaum had felt, from the first three interviews, that painful sexual experiences in childhood were probably behind the attacks of morbid fear as a grown-up.

Under pentothal, the patient recalled memories that were not new. He had recalled them before. But they bore out Dr. Rosenbaum's impression of the cause of the trouble and enabled him to point out to the patient what was back of his attacks.

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FOOD PROCESSING

Process Removes Oxygen In Vegetable Dehydration

➤ VEGETABLES being prepared for de-hydration are customarily blanched by scalding in hot water or steam. This is done mainly to destroy enzymes that would otherwise spoil colors and flavors by oxidation. This oxidation-spoilage problem is met in a different way in a process on which U. S. patent 2,415,995 has been issued to Harold K. Derby of Berkeley, Calif.

Instead of destroying the oxidizing enzymes, he removes the oxygen without which they cannot function. This is done

simply by putting the vegetables under water in a closed vessel and exhausting the air with an aspirator. After all the air has bubbled out of the vegetables, air pressure is re-admitted to the vessel, sometimes with extra air pressure added. This fills up the evacuated air spaces in their tissues with water, which is subsequently removed, along with their own natural water content, in the dehydrating process.

Rights in the patent have been assigned to F. E. Booth Company, Inc., of San Francisco.

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ENGINEERING

Better Fluorescent Lighting Will Reach Homes of Future

➤ HOMES of the future will be lighted by fluorescent fixtures.

One reason is because more light is provided by fluorescent lighting at the same cost for power than by conventional methods. Another is because better phosphors are now available, and also because circular, semi-circular and coiled tubes for home lamps have been developed that are decorative in appearance.

Shadow-free lighting is another feature of fluorescent tubes, according to a report to the American Chemical Society in Milwaukee by Dr. Sampson Isenberg of Chicago.

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TELEVISION MIRRORS—A complex optical system, developed by the American Optical Company, will produce television pictures five times larger than pre-war sets. Television images from the receiver's cathode-ray tube are enlarged by the mirror, then reflected through the correcting lens to a flat mirror which in turn reflects the focused picture onto the viewing screen.

ASTRONOMY

New Minor Planets Around Sun May Be Discovered

► NEW TINY planets may soon be discovered revolving around the sun between the orbits of Mars and Jupiter. The exact paths of other asteroids or minor planets may be worked out through intensive research just being inaugurated.

This wide research program for the study of minor planets is to be under the guidance of Dr. Paul Herget, director of the University of Cincinnati Observatory. A number of observatories are co-operating in this program sponsored by the American section of the International Astronomical Union.

Fifteen hundred minor planets, most of them tiny telescopic specks which can be distinguished from faint stars only by their motions, are now known. The first one, discovered in 1801, was almost 500 miles in diameter. Most of them, however, are probably less than 50 miles across.

Not many asteroids were spotted until recent years, when astronomers could use photographic plates. Before the war about 100 new minor planets were found each year.

"Some of these planets have not been observed since 1937," Dr. Herget states, "and then for only two months, when they should have been observed for three or four years in a row. Astronomers today are not even sure they can be located again."

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NUTRITION

Lack of Fertilizer Causes Food Shortage and Hunger

► FOOD SUPPLIES for the world's famished lands will be behind schedule all this year because of serious shortages in fertilizers, the International Emergency Food Council warns. This condition obtains despite the increase in commercial fertilizer production, especially in the United States, because the demand has gone up faster than the supply.

One prime difficulty is that whereas the greatest need for fertilizer exists in the war-ravaged lands of Europe, the increased supplies are largely in the United States, where the demand has also increased. Some manufacturers are reluctant to see their production routed to the areas of greatest need, instead of

into markets which they know will be permanent.

Deficit of all fertilizer elements—nitrogen, potash and soluble phosphates—is estimated at 2,261,000 tons.

Perhaps the most critical shortage is in nitrogen fertilizers. This is due in considerable part to the stoppage of synthetic nitrate production in Germany, a major fertilizer source in pre-war days. Only five countries in the world have more nitrogen fertilizers than they need.

There is prospect of relief in the phosphate fertilizer field. The Council's committee on fertilizers has recommended that rock phosphates available since the beginning of the present year be placed on the unallocated list. There is some improvement also in the potash supply, though not enough as yet to be justifiable cause for optimism.

Science News Letter, March 1, 1947

EDUCATION

Afghanistan Wants Men To Teach Science, English

► YOUNG MEN who would like to teach science, mathematics and English in Afghanistan, the country lying between Soviet Russia and India, are being sought by the Department of State's division of international exchange of persons.

The Afghan ministry of education is seeking 31 teachers, who would be employed in Kabul, the capital, and Kandahar, the center of Afghan history and Pushtu culture. Teaching experience and college degree are required.

English has been made the required foreign language and the two American instructors already in the country can not meet the demand for teacher training.

Science News Letter, March 1, 1947

CHEMICAL ENGINEERING

Synthetic Rubber Is Made In Continuous Stream

► SYNTHETIC RUBBER is turned out in a continuous stream, thanks to a new process described by M. A. Youker of du Pont to the American Institute of Chemical Engineers. Latex of the synthetic neoprene is converted into a thin rubber-like film by freezing a thin, ice-mixed layer on the surface of a chilled revolving metal cylinder. This method avoids the use of chemicals and operates continuously.

Science News Letter, March 1, 1947

IN SCIEN

METEOROLOGY

New Balloon Needs No Separate Parachute

► SMALL RUBBER balloons are now much used for meteorological purposes, carrying radiosondes into the upper air and dropping them by parachute for possible recovery when they finally burst. L. P. Frieder of Great Neck, N. Y., and W. S. Finken of Brooklyn have obtained patent 2,415,818 on a balloon that requires no separate parachute. A ring, secured to the rubber wall near the bottom, carries the parachute shrouds. Immediately above it is a zone of thinner rubber, providing a predetermined line of rupture. When the balloon bursts along this zone, the top is thrown off and the part of the bottom held by the ring automatically turns inside out and becomes the parachute.

Science News Letter, March 1, 1947

CHEMISTRY

Metal-Coated Plastic Fabric Is Used in Homes

► GOLD- or silver-colored fabric, of a new type, has many decorative uses in the home. It is a metal-coated plastic fabric that has a mirror-like finish. Uses range from lamps to window shades.

The base material is a mesh that resembles ordinary wire screening with the spaces filled with a cellulose acetate film. The fiber of the mesh is saran, a well-known plastic, a compound of polyvinylidene chloride.

The mesh with acetate filler is coated on one side with a thin film of aluminum applied by a high-vacuum evaporation process. This, as well as the gold or silver color, is covered with a protective lacquer. Over the silver finish, it is a clear lacquer; a gold-colored lacquer is used for the gold finish.

Because of its mirror-like finish, the new material will be known by the trade name Miramesh. It is a product of the National Research Corporation in Boston. It can be stitched, or cemented provided the cement used does not include solvents that will attack the acetate. It is not suitable for uses where it will be subject to repeated bending because the acetate may separate, leaving the mesh bare.

Science News Letter, March 1, 1947

NINE FIELDS

ZOOLOGY

Uninterested Mother Loses Child—In Zoo

► A MOTHER who "showed absolutely no interest in her baby" has had her child taken away from her. The foster mother is a broom handle.

The case of the delinquent mother was reported by R. Marlin Perkins, director of the Lincoln Park Zoo in Chicago. The child is an unusually mature two-toed sloth, born with both eyes wide open, a full set of teeth and well-developed claws.

Wrapped in cloth, the broom gives the baby sloth something to cling to in place of its mother. The 14-ounce baby, which has a bleating cry like a tiny lamb's, is fed every two hours with an eye-dropper.

The two-toed sloth is well known to crossword puzzle fans under its Indian name, 'Ai.

The baby here has no name—zoo officials aren't sure whether it is a boy or girl.

Science News Letter, March 1, 1947

PLANT PATHOLOGY

Snap Beans Can Catch Disease from Gladioli

► IF YOU WANT to raise healthy beans, keep them away from gladioli.

Discovery that beans can catch one of their most damaging diseases, yellow mosaic, from the mosaic-mottled leaves of sick gladiolus plants is announced in *Science* (Feb. 14) by a three-man research team, Dr. F. P. McWhorter of Oregon State College, and Dr. Lytton Boyle and B. F. Dana of the U. S. Department of Agriculture.

Suspicion was first cast on gladiolus as a possible carrier of yellow bean mosaic virus by Carl Robertson of the Eugene (Ore.) Fruit Growers Association, who had noticed that the rows of beans in a field next to a mass planting of gladioli were heavily infected with yellow mosaic, while those farther off were less affected.

The three plant pathologists were at first inclined to be skeptical, partly because beans and gladioli are so widely separated in the plant kingdom; but subsequent field observations, backed by

exact laboratory tests, have proven the first supposition to be correct. Only snap beans, however, get the disease from the gladioli; a parallel test planting of lima beans remained unharmed.

Since gladioli are planted in great quantities for market, especially in the Pacific Northwest, and since mosaic disease is very common in the "glad" fields, this discovery assumes considerable economic importance.

Science News Letter, March 1, 1947

CHEMISTRY

Plastics Have Many Little-Known Uses

► PLASTIC MATERIALS have many little-known uses ranging from water softeners and purifiers to adhesives for joining almost any types of materials, Dr. Paul O. Powers, of the Battelle Memorial Institute, Columbus, Ohio, told the American Chemical Society in Chicago. He included plastic products that are fast-drying printing inks and others that are better lubricating oils.

Plastic products, he said, are largely associated in the public mind with gadgets and bright-colored moulded articles familiar in everyday life. But plastics can be tailored by innumerable other applications because they are composed of very large molecules whose structure can be varied as desired, he explained.

A new flame spraying process makes it possible to apply a fine plastic film on an object as a protective coating without the use of the customary solvent. Usually solvents are required. They are expensive and large volumes are needed because otherwise plastics form a very thick solution.

In the flame spraying process, the finely divided powdered plastic is blown into a hot flame which softens the material and applies it to the surface to be coated. Other methods have been developed which use low-cost solvents by suspending rather than dissolving the plastic material, fusing the resin particles after application to obtain a continuous film.

Dr. Powers mentioned also plastics developed from silicon, the element present in sand, which are remarkably stable at high temperatures. He described a plastic made from fluorine, the unruly gas which has been tamed by wartime research, as characterized by high resistance not only to heat but also to solvents and chemicals of all types.

Science News Letter, March 1, 1947

AERONAUTICS

New Transports Offer More Speed, Comfort and Safety

► SPEED, COMFORT and greater safety are promised air travelers in new transports soon to be ready for scheduled service. Their design and operating equipment are based on lessons learned during the war, factors that helped give American planes top rating.

Among these new craft is the United Air Lines' Mainliner 300, the Douglas DC-6, the first of which will be ready for service early this summer and will quickly be followed by others. Air tests show this 56-passenger, four-engined plane to be speedy, comfortable-riding at high and low altitudes, and easy to maneuver, an important factor in safety.

Its great power is another safety factor. The four engines are Pratt and Whitney double Wasps with a total of 8,400 horsepower. They give the plane a cruising speed of 300 miles an hour, five-mile-a-minute clip, and enable it to climb rapidly, even up to an altitude of 25,000 feet. The speed is assisted by a jet thrust exhaust system, increasing it about ten miles an hour.

Another important factor in the new plane is its propeller system. The propellers are the full-feathering, reversible-pitch type, made by Hamilton. This permits the blades to be turned in their hub to present a different angle to the air, and permits also that they be reversed to decrease the speed of the plane rapidly in landing.

Electronic automatic pilot, radio altimeter, and similar war-tested apparatus are included in its equipment. Its pressurized cabin assures passengers low-altitude comfort regardless of altitude and outside temperatures.

Science News Letter, March 1, 1947

ENGINEERING

Oxide-Coated Iron Bits Hasten Steel-Cutting

► SQUIRTING a stream of fine iron particles coated with oxide into the flame of an oxy-hydrogen steel-cutting torch to hasten the operation is a process invented by G. M. Deming of Orange, N. J. He explains that the oxide coating prevents the particles from igniting prematurely. Rights in his patent, No. 2,415,815, are assigned to the Air Reduction Company, Inc.

Science News Letter, March 1, 1947

PHYSICS

Bell Rings Down a Century

Telephones have served America for 71 years, and on March 3, the inventor's hundredth birthday will be celebrated. The story of the invention is told here.

By A. C. MONAHAN

► A SCOTCHMAN by birth, an American by choice, the father of the telephone—Alexander Graham Bell—would be 100 years old on March 3, 1947, if he were alive today. By the time of his death, August 2, 1922, telephony had made gigantic forward strides from the crude instruments and methods which carried in 1876, the first spoken words ever transmitted by wire.

In the 75 years of his life, and the 46 years of telephone history, Bell found that his discovery was far more important than even he could have dreamed in earlier days. Telephones had become common household and office equipment, one could talk across the continent from Boston to San Francisco, and during his last full year of life, underwater cable lines extended to Cuba.

Telephone Expansion

Five years after his death wire conversations with Europe were established and land lines connected American cities with those of Mexico. Radio sets had become common in American homes during his life, but the radiotelephone was only in development stages.

Few, if any, dreamed then that with the radiotelephone, within such a short period of time, an American could sit in his home and talk by wire and air with his "down-under" cousin in Australia or New Zealand.

The first complete sentence was carried by wire on March 10, 1876, a year later than Bell had succeeded in transmitting sound electrically by wire. The first two-way conversation was held on October 9, 1876, over a two-mile line between Cambridgeport and Boston. During the following years, telephony improved rapidly, and new developments are taking place almost continuously.

America now has about 32,000,000 telephones. Progressive nations all over the world have modern telephone systems, but not to the per capita extent of the United States. Round-the-world conversations dramatize the world-wide exten-

sion of telephone communication. Ships at sea, planes in the air, railroad trains on the track, and moving automobiles on highways, are all within telephone communication.

End Not Reached

The end has not been reached. Telephone transmitters and receivers will become as common in cars, trucks and buses as radio receivers are today. Isolated farms also will have phones, even those that can not be reached economically by telephone wires. Where power lines exist, they can now be used for rural telephones; other isolated spots will be served by radiotelephone.

Alexander Graham Bell was not a trained scientist as the term is used today, at least not in his early life. He came to America at the age of 24 to demonstrate a visible speech system developed by his father for training the deaf to speak. He came to Boston to teach the system to the instructors in the Boston School for the Deaf.

His interest in speech may be responsible for his undertaking a "talking tele-

graph" system. The idea of using telegraph lines for talking was not new with him; others had the same idea. However, it is to Bell that the credit is due for discovering the way, and carrying it through to success.

Bell did not enter the world in a poverty-stricken Scottish cabin, but in a good home in Edinburgh. His father was a scholar, teacher, writer and lecturer on correct speech and elocution. His mother, a daughter of a naval surgeon, was an accomplished musician and portrait painter. Bell was a musician of modest ability, and at one time intended to make music his career. The science of speech, however, took priority over music.

Teaching Speech

In the five years in America before he developed a working telephone, Bell was engaged much of the time in teaching the visible speech system. In his spare moments, at first, he experimented with electrical currents and particularly with the thought of transmitting words over a wire.

His first idea was a harmonic telegraph instrument to send more than one Morse message over a single wire at one time. It had already been proved that musical tones could be transmitted by the make-and-break current of electricity. This led Bell to believe that developments might permit conversation transmission.

His work with the harmonic telegraph was successful, and he received a government patent on his instrument. It is not, however, a telephone instrument, but its development gave him the ideas that made telephoning possible. To transmit words he had to find a way to vary the intensity of the current as the sound waves, loud and soft, high and low, shrill and deep, vary in the way they disturb the air.

Another thought was that a single membrane, or diaphragm, somewhat similar to the eardrum, would gather the complexities of speech or sound in the air, and through its vibrations bring about vibrations in the current in the wire. These in turn would bring about vibrations in a membrane in the receiving end and create sound waves in the air.

These ideas were new; an important step in the development of the telephone had been born. Not an electrician by



FATHER OF TELEPHONES—
Alexander Graham Bell in 1876, the year the telephone was patented.

training, Bell studied electricity, consulted experts, visited laboratories and picked up ideas from many sources.

The idea of the familiar telephone mouthpiece to concentrate the air waves of the voice on a diaphragm came from a laboratory at the Massachusetts Institute of Technology. Experimentation with a human ear from a dead body came from a Boston doctor. Certain fundamentals on electromagnets came from Joseph Henry, then secretary of the Smithsonian Institution and a leading electrical scientist of the day. Henry was known particularly for his work in electromagnetic induction.

New Idea

In 1874, while still working on harmonic telegraphy, it occurred to Bell that one of his telegraph reeds, vibrating over its electro-magnet, would induce wave-shaped currents corresponding to its vibrations, and that several vibrating reeds would induce a complex wave-shaped current that would be the result of the vibrations of all.

While working on this idea, the telephone break came. It was on June 2, 1875, that one of the reeds stuck to its electro-magnet and, when plucked to free it, sent through the wire the twang of a plucked reed, a tone with overtones. Bell, fortunately, was on the receiving end and immediately recognized the significance of what he heard.

"The first Bell telephone" was the result of this experience. It did not come immediately, but was far enough advanced so that Bell applied for a patent early in 1876, and received it on March 10 that year. It was actually three days after the patent was issued that the first spoken sentence was transmitted by wire. By early June, however, improved instruments were developed and placed on display at the Philadelphia Centennial Exposition.

There the discovery was quickly appreciated. Included among the judges of scientific apparatus were Sir William Thompson of England, Joseph Henry of the Smithsonian, and several outstanding university physicists. Sir William Thompson, England's leading authority on electricity, went to Boston with Bell to learn more about the discovery. He pronounced it "the most wonderful thing in America." Four years later, nearly 50,000 Bell telephones were in use in the United States.

Science News Letter, March 1, 1947

CHEMISTRY

Enzyme Frees Phosphorus For Embryo Development

► A CHEMICAL "workhorse" which makes phosphorus available to the growing embryo has been discovered in research at the University of California.

This agent is an enzyme which liberates phosphorus from protein in the eggs of frogs, so that the embryo can use it in its development.

This is the first time such an enzyme has been reported. Now that the mechanism is known, scientists may find similar enzymes in higher animal forms, including man.

The research was done by Dr. Daniel Harris, formerly of the department of biochemistry at Berkeley and now at California Institute of Technology, who was studying the enzyme make-up of protoplasm. Using frog eggs, he noticed a big increase in the inorganic phosphorus content when the eggs were ground up. He traced the cause to the new enzyme, which is called phosphoprotein phosphatase.

The find may prove of immense value, in that phosphorus is essential to normal growth in all living tissue. Phosphorus is found in the nucleo-proteins, the basic substances of the cell nucleus; probably in chromosomes, heredity-determining units; and even in viruses.

The ovum is a storehouse of phosphorus, and the new research indicates that when the embryo is in need of phosphorus the enzyme pries it loose from the protein substances in which it is locked.

Science News Letter, March 1, 1947

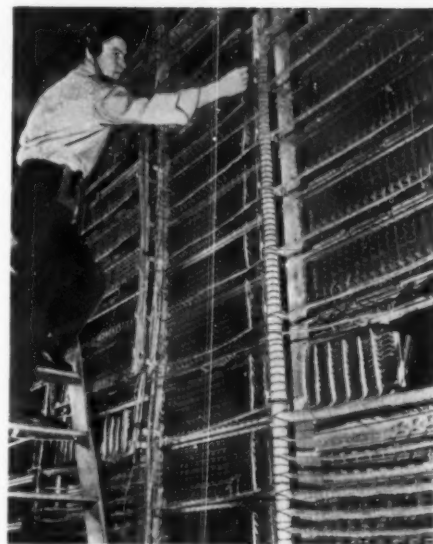
AERONAUTICS

Small Airports to Benefit Flying of Private Planes

► PRIVATE FLYING will benefit particularly by the construction of 800 smaller airports in the United States for which federal aid has been allotted by the Civil Aeronautics Administration.

With them, flying farmers will be able to go to town by air, and city business men will be able to utilize their planes in reaching smaller centers.

During the past year some 35,000 private planes have been added by the American aircraft industry to the number already in use. Many of these will be used for business purposes, and many for family flying. The growth of private



BELL'S BRAINCHILD—An important part of the telephone system, the main switching system at the Bell Telephone Laboratories duplicates every type of switching circuit in use in the telephone system today.

flying, for which air-minded America is now ready, depends upon the availability of local airports suitable for their use.

The federal government will contribute nearly \$33,900,000 for the construction or improvement of these 800 airports. Local state or other sponsors will contribute about \$37,693,000. Ports will be built in all states except Alabama. None is planned for the District of Columbia. Seventy are planned for Texas, 46 for Montana, 41 for Minnesota, 35 for Kansas, and 33 for California. In only a relatively few cases will the federal contribution per port exceed \$100,000, and in some cases it will be but a few thousand.

Science News Letter, March 1, 1947

by
W. H. GEORGE

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Do You Know?

A living evidence of fishy ancestors is the fact that *frog* eggs hatch out into tadpoles with fins, tail and gills which in a few weeks become full-lunged, terrestrial, carnivorous quadrupeds.

Rayon laminated *plastics*, consisting of a number of layers of resin-treated fabrics pressed together into a compact plate or molded article, are used for cabinets, table tops, trays, machine parts and household utensils.

Concrete *floors*, made of standard mixtures to which about 3% of asphalt emulsion has been added, have a shock-absorbing elasticity that makes them easy on the users and does not decrease strength or durability.

Helium, the noncombustible gas used in American blimps and balloons, is now usable for aluminum welding by the so-called helium-shielded arc method used in magnesium welding, thanks to a new development.

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OCEANOGRAPHY

Dust Makes Ocean Blue

New explanation of old question was found in research on light in submarine warfare. Dust particles reflect sunlight to water surface.

► WHY IS the ocean blue? A new answer to this age-old question has been found in a newly reported research attempt to use light rays in anti-submarine warfare.

In attempting to find ways of combating German submarines, two American scientists discovered that there exist in every cubic inch of clear ocean water about a million and a half dust-like particles, each about one fifty-thousandth of an inch in diameter.

These particles reflect sunlight back to the ocean surface. But the light that gets back to the surface has been filtered; water absorbs the red and yellow colors of light, leaving greens, blues and violets, the combination of which is the indigo blue common to deep ocean water.

Previously the scientific explanation for this color had been attributed to the scattering by molecules of water, just as the blue of the sky is explained by scattering due to air molecules. Less scientific explanations held that the ocean's color was a reflection of the blue sky.

The scientists, Dr. F. A. Jenkins, professor of physics at the University of California, and Dr. I. S. Bowen, now director of the Mount Wilson Observatory, conducted the research in 1941 at the U. S. Navy Electronics Laboratory in San Diego, using some of the facilities of the University of California's Scripps Institution of Oceanography.

Drs. Jenkins and Bowen found that the tiny particles played a major role in blocking their efforts to devise anti-submarine devices using light.

They found, for example, that the billions of particles suspended in the ocean, intercepting light as it passes through water, set a limit of penetration of a ray of light at a maximum of 580 feet. This limitation eliminated hopes of silhouetting submarines by dropping airplane flares below them, since it was impractical below about 200 feet.

Scattering of light by the particles also prevented bouncing light rays off submarines, similar to the use of radio waves in radar.

The same limitation was found in at-

tempts to devise an optical proximity fuze for depth charges by installing a light projector in the nose of the projectile.

Drs. Jenkins and Bowen discovered and counted the tiny particles with an ultra-microscope, which makes it possible to see objects smaller than light waves. Light is scattered by the particles, bringing them into visibility.

Dr. Jenkins said, in explanation of colors such as green, light blue, and red near shore in shallow water, that it must be assumed some colored materials are in the water. These colored materials could include microscopic marine life.

Where non-indigo colors are found in deep water, such as the reddish brown of the Red Sea, the Gulf of California, and the green in waters such as Lake Tahoe, the explanation can be almost entirely attributed to animal and plant life.

Science News Letter, March 1, 1947



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MEDICINE

Gas Gangrene Toxoids

► TOXOIDS for protection against gas gangrene, dangerous infection of deep, dirty wounds such as occur on battlefields, were ready for trial in the armed forces shortly before V-E day. Dr. Irvin S. Danielson of Lederle Laboratories revealed at the meeting of the New York Academy of Sciences.

The cessation of hostilities interrupted the trials, but previous tests on several hundred human volunteers gave results that scientists believed showed they were protected against four types of germs that produce gangrene. One of these was *Clostridium perfringens* which is found in 50% to 80% of gas gangrene in war wounds. Gas gangrene develops in from several percent to a fraction of one percent in war wounds, depending on the theater of operation. Mortality is high. In the central Mediterranean area it was over 60% in one series of 185 cases.

Chemical remedies and specific anti-serum have not been outstanding in their ability to control the infection, Dr. Danielson pointed out. Work on development of vaccinating agents or toxoids against gas gangrene was begun in 1941, both independently and under contract with the Office of Scientific Research and Development. This work was done by scientists at the University of Cincinnati, New York University, Babies Hospital in New York, George Washington University, the National Institute of Health and the Lederle Laboratories.

As a result toxoids were developed which gave solid immunity to mice, guinea pigs, rabbits and dogs against living germs and toxins of three gas gangrene infections. These same preparations gave comparable results in the human guinea pigs.

Science News Letter, March 1, 1947

MEDICINE

Antitoxin For Diphtheria

► THE DIPHTHERIA patient's chance for survival depends on the day of the disease antitoxin is first given. The earlier he gets it, the better his chance for getting well, Dr. Franklin H. Top of Detroit reported to the American Public Health Association.

Cases of the severe, gravis type can be cured by antitoxin if it is given early enough and in large enough doses. Not even penicillin can take the place of antitoxin for diphtheria. The reason is that although penicillin can stop the germs in the test tube, it cannot neutralize the poison they produce. It is this poison, or toxin, that causes the symptoms and can kill the patient. Penicillin, however, may be useful in treating diphtheria patients if complications occur or

if the patient has streptococcus infection at the same time.

Alum-precipitated toxoid, called APT for short, is Dr. Top's favorite weapon for preventing diphtheria, although a number of other preventive substances can be used. All babies between nine months and one year of age should get this protection, given in two injections one month to six weeks apart.

Booster doses are advised at the age of two and again before entering school for the first time because the number of cases and carriers of diphtheria is declining. This decline cuts down the

chance of the child's getting a natural booster of his immunity through small doses of germs caught from carriers or patients he might come in contact with.

Science News Letter, March 1, 1947

AGRICULTURE

DDT to Halt Worms in Apples

► THE UNPLEASANT experience of finding a worm (or maybe only a half-worm) in an apple is due to become less frequent, as DDT spraying becomes more widely adopted by orchardists. This year, U. S. Department of Agriculture scientists state, this revolutionary insecticide will probably be used in from one-third to one-half of all American apple orchards.

Most of the so-called worms in apples are not really worms, but the larvae of the codling moth. Against this pest DDT is peculiarly effective. It has also been found deadly to a number of other fruit-damaging insects, including pear thrips, oriental fruit moth and grape leafhopper.

In the concentrations used at present, however, DDT does not kill leaf mites, woolly apple aphid and red-banded leaf-roller. These even increase in abundance after DDT spraying, due partly to its effect on the predatory and parasitic insects that ordinarily hold them in check. Something will have to be done about this situation before DDT can be considered an unqualified success as an orchard spray.

Science News Letter, March 1, 1947

The place of cancer in the medical school curriculum is to be made more important; a national committee is planning ways by which medical students can be informed about all the latest developments in cancer treatment.

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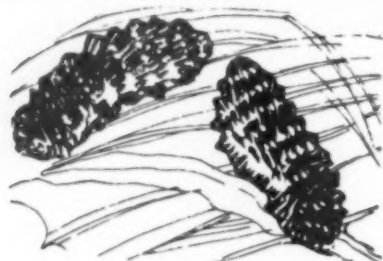
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Veterans of Winter

► WOOLLY-BEAR caterpillars sometimes surprise us, during spells of mild winter weather, by suddenly appearing out of nowhere, to go humpity-hump across our paths. Most of us, remembering the first (and perhaps only) nature lessons we received, think that proper caterpillars should spin themselves into cocoons in the fall, to emerge as butterflies or moths in the spring. To see a caterpillar active so long after autumn seems a contradiction of our kindergarten lesson.

It is a contradiction. We didn't learn everything in the kindergarten—least of all about nature. The teacher gave us as much as she thought we could absorb at the time; it isn't her fault if we stopped learning when she stopped teaching us. The story she gave us is true enough—

for that kind of caterpillar. Woolly-bears, and a great many other kinds, have a different kind of life-history. They hatch and grow up in late summer, hide out in sheltered cracks and crannies during the winter, and go on being caterpillars for a while when warm weather comes again. Then they spin sketchy nests (hardly to be dignified as cocoons), sleep briefly as pupae, and emerge as adults.

Still other members of the butterfly-moth order live through the winter as adults, clinging motionless to bark or twigs in the woods. A familiar example is the beautiful dark-winged mourning-cloak butterfly.

What is true for members of this one order is true throughout the whole world of many-legged lesser animal life. Whole hosts of insects, spiders, etc., quietly die in autumn, leaving only their eggs to survive the winter and renew the life of their species in spring. Others endure the hard season as larvae or pupae, hidden away in the safest lurking-places they can find, and ready to complete metamorphosis into adults when the sun shines longer and more warmly each day. Still others manage to live through as adults, and are thus able to get an early start when warmth permits them to move and feed and mate again.

Science News Letter, March 1, 1947

CHEMICAL ENGINEERING

Materials Flow Together To Give Product in Process

► CONTINUOUS manufacture of chemicals with two or more materials flowing together and producing some needed product is the latest method in chemical engineering.

One of the materials needed for soap is made in this way, a chemical team from Colgate-Palmolive-Peet Co., Jersey City, reported to the American Institute of Chemical Engineers meeting in Louisville, Ky. Fatty oil is pumped one direction and water another under high pressure and temperature and fatty acids and aqueous glycerol result.

A continuous method of making greases by this new and better way was reported by Dr. H. G. Houlton of Girdler Corporation of Louisville. Quality varied from batch to batch in the past, while for four years superior, uniform lubricating grease has been produced at the rate of 60 pounds a minute from each machine used.

Science News Letter, March 1, 1947

CHEMICAL ENGINEERING

Whiskey May Become Distillery By-Product

► WHISKEY may become a mere by-product of the distilleries.

If it does, it will be because the soluble wastes from making whiskey are worth more as feed for livestock and poultry than whiskey is as a drink. J. W. Spanyer, Jr., of the Brown-Forman Distillers Corp., told the American Institute of Chemical Engineers that that time may come.

Solids from soluble waste, a liquid left at the bottom of the stills after the whiskey and "light grain" by-product have been removed, have produced startling results as a feed. The wastes are better feed, Mr. Spanyer explained, than the original grain. "In fact," Mr. Spanyer concluded, "some of the feeding experiments conducted with this material by various universities have been so startling that one distillery official states that whiskey may eventually be the by-product of the distilling industry."

Science News Letter, March 1, 1947

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ACRES AND PEOPLE—Earley Vernon Wilcox—Orange Judd, 297 p., illus., \$3. The problem of balancing acres and people to counteract starvation in those countries, particularly in the Orient, where a sub-marginal diet is the rule, is attacked from all angles that might contribute to its solution.

CARDIOVASCULAR DISEASES—David Scherf and Linn J. Boyd—Lippincott, 478 p., illus., \$10. Completely rewritten and up-to-date version of a favorably received book on diseases of the heart and blood vessels which seems likely to be useful to practicing physicians.

CHARLES - EDOUARD BROWN - SEQUARD; A NINETEENTH CENTURY NEUROLOGIST AND ENDOCRINOLOGIST—J. M. D. Olmsted—Johns Hopkins Press, 253 p., \$3. Tribute to the last in the line of a great tradition of French experimental physiology at the *College de France*.

CONCISE CHEMICAL AND TECHNICAL DICTIONARY—H. Bennett, ed.—Chemical Pub., 1054 p., \$10. About 50,000 definitions including every field of scientific or technical development.

ELECTRONS (+ and -) PROTONS, PHOTONS, NEUTRONS, MESOTRONS, AND COSMIC RAYS—Robert A. Millikan—Univ. of Chicago Press., rev. ed., 640 p., illus., \$6. The discoveries in physics for the last fifty years brought up to date to include the recent discoveries of new elements in the structure of the universe; also the latest values of the electrical and radiation units.

INTERNATIONAL AGENCIES IN WHICH THE UNITED STATES GOVERNMENT PARTICIPATES, Dept. of State Publ. No. 2699, —U. S. Govt. Printing Office, 322 p., paper, 65 cents. A listing of those agencies devoted to international cooperation.

THE LAMINA TERMINALIS AND PREOPTIC RECESS IN AMPHIBIA—Albert M. Reese—Smithsonian Inst., 9 p., 15 cents—Smithsonian Miscellaneous Collections Vol. 106, No. 19, Publication 3867.

NEW DEVELOPMENTS IN HARDWOOD PULP—Northeastern Wood Utilization Council

—Publ. by the Council, Bulletin No. 14, 123 p., paper, \$2. Report of Conference at Syracuse, N. Y., October 2, 1946.

PARTICIPATION OF THE UNITED STATES GOVERNMENT IN INTERNATIONAL CONFERENCES JULY 1, 1941-JUNE 30, 1945—Dept. of State Publ. 2665, Govt. Printing Office, 232 p., paper, 45 cents.

PORTLAND CEMENT TECHNOLOGY—J. C. Witt—Chemical Pub.—518 p., illus., \$10. Information on every step of cement manufacture; emphasis on materials rather than plant equipment.

THE PRODUCTION AND PROPERTIES OF PLASTICS—S. Leon Kaye—Int. Textbook, 612 p., illus., \$5. Technical treatment of field of plastics for use as textbook and reference source.

SPLENDORS OF THE SKY—Charles and Helen Federer—Sky Pub., 34 p., illus., paper, 50 cents. Excellent photographs of solar phenomena; an invitation to astronomy.

THE STORY OF HUMAN BIRTH—Alan Frank Guttmacher—Penguin, 214 p., illus., paper, 25 cents. This entertaining, instructive book made available at a low price, will be useful to prospective parents and others desiring accurate information simply told.

SUBTROPICAL FLOW PATTERNS IN SUMMER—Herbert Riehl—Univ. of Chicago Press, 64 p., paper, \$1.25. A publication of the Dept. of Meteorology of the University of Chicago.

THE UNITED STATES AND THE UNITED NATIONS—Report by the President to the Congress for the year 1946—Dept. of State Publ. 2735—Govt. Printing Office, 220 p., paper, 45 cents. The activities of the United Nations and the participation of the United States therein.

WORLD ALMANAC, New York World-Telegram, 912 p., paper, \$1. Sections on Atomic Energy, Electronics, and a Science Review for 1946 were written by Science Service.

YOUR COMMUNITY: Its Provision for Health, Education, Safety and Welfare—Joanna C. Colcord—Russell Sage Foundation, 3rd ed., 263 p., \$1.50. A guide for community study.

Science News Letter, March 1, 1947

PSYCHOLOGY

War's Effect on Campus

► **GIRLS WHO** entered college during the war did not adjust as well to college life as those who had begun their college educations before the war broke out in 1941, Dr. Annelies A. Rose, department of psychology, Smith College, states in a report to the *Journal of Social Psychology*.

Reason for this, Dr. Rose explains, is that adolescents are just beginning to feel

at ease socially and in their relations to the opposite sex when they enter college. The war halted normal social life, leaving a feeling of insecurity that carried over into social, emotional and health problems.

The teen-age girl's growth into a poised, calm, steady person was probably affected by the war. Few social activities, fewer available boys and the fear lest

she miss her chance to get married were possible causes, suggests Dr. Rose.

Students who graduated in 1945 were found to be better adjusted in all ways than the girls who entered college a year after them and graduated in 1946. The class of '47, which will graduate this year, followed the same trend toward a less satisfactory adjustment.

The greatest difference in the two groups tested was emotional. Frequent spells of blues were more characteristic of the group tested in 1945. More girls in 1945 than those tested in 1944 admitted emotional excitability and lack of control. Daydreaming, a way of making up for things they wanted and did not have, showed the greatest increase from 42.3% to 70.0%.

Students in 1945 reflected wartime conditions with a definite feeling of inadequacy. A greater than average number worried about their grades, and many of these were C and B students. Dr. Rose suggests that the shortage of men and social life made grades seem unduly important to all the students.

Science News Letter, March 1, 1947

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✿ **SANDPAPER**, recently patented, has attached backing strips with projecting ends that can be turned upright to form a handle. The backing strips are separated from each other, and between them are lines of perforation in the sandpaper itself that permit easy tearing.

Science News Letter, March 1, 1947

✿ **PLUG-IN** connector for portable gas appliances is usable in homes as well as in laboratories and shops. When the plug-in fixture on the flexible tubing is pushed into an outlet plug on the gas line, a metal-to-metal gas-way seal is formed.

Science News Letter, March 1, 1947

✿ **FISHING ROD** made of beryllium-copper tubing is strong, springy, corrosion-proof, and can be used in either fresh or salt water. Of the telescopic type, it is 17 inches long when closed and 57 inches in length when extended.

Science News Letter, March 1, 1947

✿ **HOUSEHOLD** ironers of the rotary type when not in use fold up to form one-third to one-half the space needed when in operation. They have folding end shelves to store ironed clothing, and a folding lapboard to prevent damp clothes coming into contact with the floor.

Science News Letter, March 1, 1947

✿ **SILICON** crystal converter, for use as first detector in high-frequency superheterodyne receivers, is pre-set in small cartridges as shown in the picture. Unlike



vacuum tubes, it requires no filament or heater supply and takes only a fraction of the space.

Science News Letter, March 1, 1947

✿ **MAGNETIC HOLDER** for tooth brushes and other toilet articles is an elongated casing fastened to the wall. The holders inside are small, permanent horseshoe magnets with poles pointing outward. Articles of magnetic material placed over the magnetic poles stick to the plastic covering.

Science News Letter, March 1, 1947

✿ **LIBRARY CHESTS** for eight- and 16-millimeter film have a push-button control by which any particular roll of film is moved forward for easy removal. The door of the all-metal welded chest opens downward. Self-aligning stacking inside prevents rolls from falling out of position.

Science News Letter, March 1, 1947

✿ **LUMINOUS TUBING**, made of a flexible, tough, semi-transparent plastic that is also moisture- and acid-resistant, is coated on the inside with a radioactive material which makes it clearly visible in complete darkness for a considerable distance.

Science News Letter, March 1, 1947

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